

TERBIUM OR LUTETIUM CONTAINING  
SCINTILLATOR COMPOSITIONS HAVING  
INCREASED RESISTANCE TO RADIATION  
DAMAGE

ABSTRACT OF THE DISCLOSURE

In some aspects, a scintillator composition includes, prior to annealing, the composition  $(G_{1-x-y}A_xRE_y)_aD_zO_{12}$ , wherein D is selected from the group consisting of Al, Ga and In, G is selected from the group consisting of Tb, Y, La, Gd, and Yb, A is selected from the group consisting of Lu, Y, La, Gd, and Yb, and RE is selected from the group consisting of Ho, Er, Tm and Ce, and x is in the range from 0 up to about 0.2774, inclusive, y is in the range from about 0.001 up to about 0.012, inclusive, a is in the range 2.884 up to about 3.032, inclusive, and z is in the range from about 4.968 up to about 5.116, inclusive.